



Deep Seabed Mining in the Pacific – considerations on impacts and benefits¹

1. Key points

The Pacific Islands region is endowed with deep seabed mineral resources that can be harnessed to support economic growth and development in a number of Pacific Island Countries and Territories (PICTs).

Outside of the borders of the territorial sea, the ocean floor and subsoil thereof is divided in two distinct legal regimes: the ocean floor under national jurisdiction, which includes the extended continental shelf beyond 200nm and is under the sovereignty of the coastal state, and the Area, which is beyond national jurisdiction. The Area is considered common heritage of mankind and is managed by the international seabed authority (ISA).

There are three main types of polymetallic mineral deposits that occur on the deeper part of the global ocean, namely (i) Seafloor Massive Sulphides (SMS), (ii) Manganese Nodules (MN), and (iii) Cobalt-rich Crusts (CRC). These mineral deposits occur both within national jurisdictions of many coastal states and in the Area.

Based on the results of scientific research and commercial mineral exploration in the last five decades, these three mineral types occur within the national jurisdiction of most PICTs in variable abundance and spatial coverage. The following countries have high potential for SMS within their national jurisdiction: PNG, Solomon Islands, Vanuatu, Fiji, and Tonga. The Cook Islands has significant abundance of MN and to a lesser extent Kiribati, while the Republic of Marshall Islands, French Polynesia and the Federated States of Micronesia have high CRC potential.

In addition, four countries, namely Nauru, Tonga, Kiribati and Cook Islands have recognized deep seabed mining as a new economic development opportunity, and they have decided to become Sponsoring States in “the Area”. Like many developing states, these four Pacific Sponsoring States together with the company that each country has sponsored, have secured license areas through the International Seabed Authority (ISA) in the manganese nodule-rich area in the central-eastern Pacific Ocean called the Clarion-Clipperton Fracture Zone (CCZ).

Nauru and Tonga are sponsoring foreign companies while Kiribati and Cook Islands have established their respective state-owned-enterprise to secure exploration licenses. These state-owned enterprises have engaged sub-contractors through a separate agreement to carry out deep seabed mineral activities in their license areas in the CCZ.

Recently, a few countries, including at least 3 PICTs and Civil Society Organisations (CSOs) have called for caution including a 10-year moratorium on deep seabed mining while potential environment hazards and benefits are fully assessed.



2. Challenges and opportunities (*appetite for integrated ocean governance*)

Challenges:

Currently there is no deep seabed mining anywhere in the world, hence the technology has yet to be tested. The potential environmental impacts as well as the financial models (including revenue that will be generated from mining) are based on available data and information and best estimate but not on real mining scenarios.

Similar to on land mining, deep seabed mining has a long gestation period and the upfront capital cost of any mining project is usually very high, hence it is considered by many players, including mining companies and investors, as a new, unknown and very risky venture whereby the return on their investment is uncertain. This can attribute to the current low investment in deep seabed mining projects.

A sponsoring state must exercise high standards of due diligence to comply with the terms of any mining license/contract issued by ISA and given the limited resources of PICs it may be a significant challenge for PICs to exercise this high standard of due diligence.

Deep seabed mining is expected to have significant adverse impacts on the seabed biological resources including those that are associated with active hydrothermal vents, which can potentially be used for their genetic properties. The partial destruction of these biological resources may adversely impact their potential uses.

Sediment plumes created during mining activities, particularly from manganese nodule mining, can remain suspended in the water column and travel long distances, which may have some adverse impacts on fishery resources and marine ecosystems.

These sediment plumes, as well as noise and light pollution associated with mining activities, may have impacts on migratory species, many of which are vulnerable. This in turn could impact traditional and cultural practices in the Pacific as well have possible impacts on tourism.

The Nautilus Minerals Inc's Solwara 1 Project in Papua New Guinea was the first DSM project in the Pacific. Due to lack of financial resources the project was discontinued. The company, which is foreign owned, sought protection against creditors in an overseas court, highlighting the possible legal and financial risks that such ventures entails if not properly planned. It is also an example highlighting the complexity and cost of such endeavors.

Many PICTs have consistently raised their concern about the potential impacts of deep seabed mineral activities on fishery resources including international upstream and transboundary effects. The PICTs are heavily dependent on fishery resources and collectively they have a valid concern that needs to be considered and addressed. A study was carried out by NIWA for SPC assessing the potential impacts of mining activities on Pacific Island fisheries.



Impacts of DSM activities on coastal ecosystems must also be considered if the mining areas or plumes possibly have physical or ecological connectivity with the coastal areas.

The potential impacts of onshore transportation and/or processing activities on local communities and on coastal ecosystems and other land uses and economic activities must also be considered.

Possible contributions to climate change must be considered in any assessment of potential impacts from DSM. There is a possibility of release of greenhouse gases to the atmosphere from disturbance and bringing settled and decomposed carbon materials to the surface. Greenhouse gas emissions must be part of any environmental impact assessment of any development to exploit these potential fossil fuel reserves.

The PICTs need to call for the application of the Precautionary principle and science-based decision making in all deep seabed mineral activities in both national jurisdiction and the Area that will ensure adverse impacts on the living resources of the ocean are avoided or minimized.

Opportunities:

The PICTs are continuously being challenged to expand their economic base in order to not only support sustained economic growth but also to assist stabilize their economy from external shocks. As highlighted above, some PICTs have identified deep seabed mining (both within national jurisdiction and in the Area) as an opportunity to participate in an alternative economic development sector.

Marine scientific research and mineral exploration activities would acquire the much needed scientific data and information (i.e. geological, biological and environmental) that support PICTs in making informed decisions.

Deep seabed mineral resources, if developed in a responsible manner, can bring monetary and non-monetary benefits (i.e. capacity building / institutional strengthening, partnerships, etc.) to PICTs. This has been the subject of a cost-benefit analysis of deep-sea mining in 3 PICTs carried out by Cardno for SPC; and the recent Massachusetts Institute of Technology (MIT) comparative study of economic studies for MN, conducted for the ISA.

In accordance with relevant provisions of the United Nations Convention on the Law of the Sea (UNCLOS), the ISA is responsible for ensuring that benefits emanating from deep seabed mining will be equitably shared among State Parties.

The four Pacific Sponsoring States may enjoy additional benefits such as extra revenue and capacity building opportunities as per the agreement with their respective contractors. Small Island Developing States (SIDS) need to work together to ensure that their special circumstances are taken into account at the ISA Council and Assembly meetings in order for SIDS to gain equitable benefits when deep seabed mining commences in the Area.



It will be important to ensure potential benefits for PICTs from deep seabed mining in national jurisdictions and the Area are maximized through the development of specific fiscal management frameworks including transparency and legal, fiscal revenue and wealth management frameworks.

The demand for metals worldwide, similar to other commodities, is growing exponentially. There are two ways to meet this grow demand: (i) to extract seabed mineral resources, and/or (ii) to increase the recycling of used metals.

3. How issues link to key policies (SDG14, FPO, Samoa Pathway, 2050 Regional Strategy, etc.)

- Deep seabed mineral resources must be sustainably harvested and used to benefit not only the current generation but also future generations via the establishment of national sovereign wealth funds, while not undermining the rights and interests of these generations to a clean environment.
- Recognising the potential adverse impacts of deep seabed mining, PICTs and relevant development partners must ensure that our ocean remains healthy, productive and resilient.
- Through national policy and legislation, the contractor / mining company is responsible for addressing any potential environmental damage emanating from its mining operations using “the precautionary approach” and “the polluter pays principle”.
- The Regional DSM Agreement developed by SPC at the request of PICTs must align to the 2050 Blue Pacific Continent Strategy and whether PICTs will benefit from DSM activities in the next 2-3 decades have to be included in the Strategy. PICTs should realize the benefits emanating from deep seabed mining consistent with the rights and duties provided for in UNCLOS, including the duty to protect and preserve the marine environment.



4. Background and other reference materials

- Cardno. 2015. An Assessment of the Coasts and Benefits of Mining Deep-sea Minerals in the Pacific Islands Region. Prepared for the Secretariat of the Pacific Community.
- Group of Experts of the Regular Process (Innis, L. and Simcock, A., Joint Coordinators) The First Global Integrated Marine Assessment: World Ocean Assessment I. United Nations Regular Process for Global Reporting and Assessment of the State of the Marine Environment, including Socioeconomic Aspects. United Nations, New York, NY, 2016. Can be downloaded at [http://www.un.org/Depts/los/global reporting/WOA_RegProcess.htm](http://www.un.org/Depts/los/global%20reporting/WOA_RegProcess.htm)
- Massachusetts Institute of Technology (MIT). 2019. Comparative Study of Economic Models for Polymetallic Nodule Mining. Prepared for the International Seabed Authority.
- NIWA. 2016. Assessment of the potential impacts of deep seabed mining on Pacific Island fisheries. Prepared for the Pacific Community.
- United Nations Convention on the Law of Sea.

ⁱ This brief was compiled by SPC with inputs from relevant organisations and experts.